February 20, 1947.

Passaic Valley Sewerage Commissioners,
24 Branford Place,
Newark, New Jersey.

Gentlemen:-

I have no knowledge of many inspections of the sedimentation basins said to have been made by representatives of the Federal authorities, and if such inspections were made they could not have been of the scope as appears in the Stipulation where the Passaic Valley Sewerage Commissioners "will render expert or other assistance" in aid of such inspection.

A large part of such assistance to be rendered would be the presentation of accurate and true records of the sewage treatment plant operating data, starting from the first day of operation on August 2, 1924, in a continuous line with no breaks, to account for every pound of our sewage solids and to show their final disposition and thus prove that the deposited solids called sewage sludge were prevented from entering either New York Bay or Newark Bay. Such assistance in an inspection is the same data as has been requested recently by the Interstate Sanitation Commission.

The practice of allowing the deposited sludge to remain and accumulate in the hoppers is directly contrary to one of the most important fundamental principles of sewage treatment practice where in plain sedimentation treatment of sewage the important principle is to separate the solids from the liquid promptly. By allowing the sludge to accumulate in the hoppers of our sedimentation basins, space is occupied with accumulations of already deposited sludge which leaves no room for the deposition of further ever-incoming solids; the accumulated sludge putrefies in the hoppers with violent evolution of gases, which stirs up the deposited sludge and also floats great quantities up to the surface where some disintegrates and floats over the weirs into New York Bay, and much more accumulates to form thick blankets of sludge, not natural scums, on the water surfaces of the sedimentation basins. This defeats the efficiency of sedimentation and nullifies the basic intent of the Stipulation.

An intermediate container, between the basins and barge is necessary, such as a sludge storage-solids-concentration-water-decantation tank.

The Stipulation has nothing to say about what should be done with the New York sewage. It has all to say, in plain terms of the Sanitation Engineer, about Passaic Valley sewage and how it shall be treated and just what results shall be secured. It does not seem to give us any discretionary power to let down in the standards of sewage treatment efficiency on the grounds of economy or otherwise, nor leave us with any choice to say: "thus far will we go and no farther", neither to say: "We should not stop polluting until New York does".

With reference to the paragraphs from the March 15,1944 report of the chemist, quoted by the Chief Engineer in his comments on "Conditions at Passaic Valley Dispersion Area at Robbins Reef in New York Bay"(Jan. 27, 1947), the original report there refers to the whole of New York Bay.The paragraph which follows the one quoted from the original report should have been included to give a fair sense of values, viz:-

"The conclusions above refer to the effect of Passaic Valley sewage upon the Upper New York Bay as a whole, but if attention is centered upon the relatively small area of waters in the immediate vicinity of the Passaic Valley sewage dispersion field at Robbins Reef, some exceptions have to be noted in the frequent but intermittent appearances of color, sewage odor and visible suspended particles from Passaic Valley sewage coming into Upper New York Bay."

So that there will be no misunderstandings on these points the whole section referring to Passaic Valley sewage and New York Bay from the Chemist's report from which the Chief Engineer has quoted, is attached hereto as APPENDIX ONE with tables brought up to date to include 1946. Also attached is APPENDIX TWO giving further material which has bearing on these conclusions.

RCS/RCS

Respectfully submitted,

Richard C. Smith.

...ist's Yearly Report for 1943 to Chief Engineer. Copied ... copy of same and submitted here as APPENDIX ONE to ... February 20, 1947.

...R-NEW YORK BAY AS AFFECTED BY PASSAIC VALLEY SEWAGE

The combined sewages and industrial wastes from the municipalities which use the Passaic Valley Trunk Sewer have been treated in the sewage treatment plant at Newark Bay before final discharge into Upper New York Bay during a period of slightly more than nineteen years. The method of treatment applied at Newark Bay is in accordance with one of the Stipulations im the United States Permit to discharge Passaic Valley sewage into New York Bay. This process of sewage treatment is the first safeguard against damage to Upper New York Bay as receiving waters for Passaic Valley sewage.

Further safeguards are set up in the Stipulations of the Federal Permit which are in the nature of specifications for the practical results which must be secured in the waters of New York Bay. In the Federal Permit it is agreed between the United States and the Passaic Valley Sewerage Commissioners that, in the operation of the sewer system, specified results shall be secured at all times. These stipulated results, as they apply to New York Bay, are repeated briefly for convenience im reference as follows:

(1) Absence in New York Bay of visible suspended particles coming from Passaic Valley sewage.

(2) Absence of deposits objectionable to the Secretary of War of the United States.

(3) Absence of odors due to the putrefaction of organic matters in the sewage.

(4) A practical absence on the surface of any grease or color.

(5) No injury to the public health will be occasioned and no public or private nuisance created.

(6) Absence of injurious effect upon property of the United States in New York harbor.

(7) Absence of reduction in the dissolved oxygen contents of the waters of New York Bay, to such an extent as to interfere with major fish life.

The most critical and stringent limits imposed in the Federal stipulations are, in the order of their delicacy and difficulty of maintenance:- absence of reduction in dissolved oxygen contents of the receiving waters; absence of odors due to putrefaction; practical absence on the surface of any grease or color; absence in New York Bay of visible suspended particles coming from Passaic Valley sewage. If these critical factors are kept within the limits as specified, the more gross damages of objectionable deposits, injury to public health, injury to United States property, and creation of public or private nuisance, are not likely to become manifest.

The gross damages have not appeared as the result of almost twenty years of the discharge of Passaic Valley sewage into New York Bay and no indications have become apparent that they are likely to occur in the near future under present conditions of operation.

Items (2), (5) and (6) of the Stipulations therefore do not require extended discussion at this time and the non-appearance of these conditions undoubtedly is due to the fact that the more stringent limits as stipulated in Items (1), (3), (4), and (7) have been generally well met during the years in which Passaic Valley sewage has been discharged, after treatment, into Upper New York Bay.

Frequent and regular quantitative determinations of the saturation of dissolved oxygen in the waters of New York Bay are the delicate and important indicators which serve to give warning of depreciation or of improvement in the condition of the waters. In fact the stipulation which guards against depletion of oxygen is the most difficult one to meet and the record of dissolved oxygen values maintained by the Passaic Valley Sewerage Commsrs. during a period of almost twenty-one years is of important value in proving that Passaic Valley sewage has not damaged New York Bay to the extent that was feared and confidently expected by some authorities several years ago.

In Table 5 and Chart 2 these measured dissolved oxygen values are presented in averaged form during the summers of twenty-one years for ready comparison. Included in this series of consecutive summers are the results of tests made in the summer of 1923, one year before the Passaic Valley Trunk Sewer was put into operation.

While these tabulations of dissolved oxygen values indicate a trend to slight depletion of dissolved oxygen over a long period of years at most of the sampling stations established over New York Bay in 1923, the indicated depletion should not be attributed entirely to Passaic Valley sewage because polluting wastes from many sources, greater in volume and greater in intensity of pollutional potential than Passaic Valley effluent, enter into New York Bay at numerous and widely spread points of discharge. Even if this trend to slight depletion of dissolved oxygen were entirely due to Passaic Valley sewage it is not serious and the Stipulation in the Federal Permit would be satisfied because it is not "a reduction in the dissolved oxygen contents of the waters of New York Bay, to such an extent as to interfere with major fish life". Again it will be seen in Table 5 and Chart 2 that a considerable deficiency in dissolved oxygen values existed in New York Bay one year before the Passaic Valley Trunk Sewer was placed

since the Passaic Valley discharge started there is additional depletion shown.

basis of the facts assembled from the many tests and inspections regularly by the Passaic Valley Sewerage Commissioners during the of twenty-one years it is fair to conclude that the grave results were at one time confidently expected and feared have not materialized furthermore, Passaic Valley sewage effluent has not affected the whole of New York Bay deleteriously to any marked degree. It is also indicated that most of the results specified in the terms of the Federal Stipulations have been generally secured.

The conclusions above refer to the effect of Passaic Valley sewage upon the Upper New York Bay as a whole, but if attention is centered upon the relatively small area of waters in the immediate vicinity of the Passaic Valley sewage dispersion field at Robbins Reef, some exceptions have to be noted in the frequent but intermittent appearances of color, sewage odor and visible suspended particles from Passaic Valley sewage coming into Upper New York Bay.

Appearances of color, sewage odors and visible suspended particles of sewage sediment from Passaic Valley sewage do occur at times in the diffusion area as indicated in Table 6.

The appearances of color may be discounted because the Stipulations in the United States Permit allow of "practical absence" of color thus implying that some color was expected and allowance made for it.

This leaves "odors due to the putrefaction of organic matters in the sewage" and "visible suspended particles coming from Passaic Valley sewage" to be considered.

It is difficult to describe these undesired appearances of Passaic Valley sewage in proper terms of their true relative significance and if they are seized upon alone and unduly emphasized, it is easy to exaggerate and to present an unfair picture of actual conditions.

In this connection it should be remembered that the area in which these things appear is very small when compared to the whole of Upper New York Bay. Again, it should be emphasized that these undesired appearances are not continuous but intermittent and occur at certain states of the tides, usually at "slack water" during reversals of the tidal currents which take place four times in every twenty-four hour period. The appearances of color, odor and suspended particles, allowed to come to the surface by the slackening of the tidal currents, usually last at most about an hour and a half. These intermittent appearances are almost always confined to the immediate area in the vicinity of the deeply submerged diffusion nozzles. At times, however, the odors of the sewage are spread further afield by being carried on air currents some distance from Robbins Reef because of direction of wind or other atmospheric conditions.

Table 6 presents a proportional enumeration of the observed appearances

continued.

Valley sewage in the sewage dispersion area at Robbins Reef
hout a period of twenty years. The tabulation does not record the
total of these appearances because observations are made twice
weekly only, weather permitting, but some fair idea of average conditions
over all states of the tides may be obtained from the table. By taking all
tidal stages into account a fairly true idea in proper perspective may be
derived because if all observations were made at selected slack water
periods the picture of conditions would be distorted and biased on the
undesirable side, and conversely, selection of periods when strongly
flowing tides were prevailing would result in an inaccurate view of almost
perfect conditions.

Table 6, which indicates the physical aspect of conditions at
he Passaic Valley sewage dispersion area at Robbins Reef in Upper New
ork Bay, is significant when the observations of the whole of twenty
ears is briefed as follows:-

Years 1924-1943, inclusive

Grand Total of Inspections throughout 20 years. . . . 1515
Color in evidence 431 times or 28.4% of total.
Odors in evidence 285 times or 18.8% of total.
Suspended particles in evidence 190 times or 12.5% of total.

This shows that in the relatively small area of the immediate
ewage dispersion field at Robbins Reef undesired appearances of Passaic
alley sewage occur intermittently in periods of short duration, but if
he terms of the Stipulations in the Federal Permit are applied to the
eneral condition of the whole of Upper New York Bay as affected by the
scharge of Passaic Valley sewage, the items contained in the Stipulations
garding the results to be secured have been satisfied almost in full.

SSAIC VALLEY SEWAGE SLUDGE

Passaic Valley sewage undergoes a process of treatment at the
wark Bay Pumping Station before it is discharged into New York Bay.
is treatment, intended to remove gross solids and the finer solids
ich respond to sedimentation, is a requirement of the Federal Permit.
e purpose is to remove large amounts of putrefactive and grossly polluting
lids from the sewage and thus reduce the pollutional load upon New York
y from this source.

The large and gross fragments of solid material are removed in
e grit chambers and on the screens, the finer and settleable particles
positing in the hoppers at the bottom of the sedimentation basins.

The liquid portion of the sewage, after being freed from much
the suspended and insoluble solids, escapes over the weirs into the
in outfall tunnel and thence through the diffusion nozzles into Upper
w York Bay at Robbins Reef.

The putrefying solids which collect in the hoppers are removed
intervals and loaded into a barge in which they are transported to sea
dumped in an area designated by the Federal Government, under supervision

of the Supervisor of New York Harbor.

Like all sewage sludges the Passaic Valley sewage sludge contains considerable amounts of water, and because the Federal Government requires a high removal of solids and in addition, it being poor economy to ship water to sea, the thickest sludge is selected to be placed in the barge.

The aim therefore is to keep the water as low as possible in the sludge going to the barge. Table 7, which presents moisture determinations in Passaic Valley sewage sludge for a number of years, indicates that in the handling of the sludge the water content has been kept down consistently to a satisfactory and economical minimum.

CS:RCS

Respectfully submitted,

(Signed in the original report),
Richard C. Smith

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TABLE 6

PHYSICAL ASPECTS AT DISPERSION AREA, ROBBINS REEF

SUMMARY OF CONDITIONS AS FOUND DURING INSPECTIONS

THROUGHOUT THE STATED YEARS

Year	Number of Inspections	Color	Odor	Solids	Number of good Conditions	Percentage of inspections found satisfactory conditions, Absence of color odor and solids being classed as satisfactory.
1924**	26	1	0	1	24	96.1
1925	52	7	1	0	45	86.5
1926	71	13	6	0	58	81.6
1927	74	15	8	5	59	79.7
1928	75	13	2	3	62	82.6
1929	64	8	5	4	56	87.5
1930	78	23	13	7	54	69.2
1931	77	22	14	10	55	71.4
1932	82	32	22	16	50	61.0
1933	81	35	25	22	46	56.8
1934	78	34	33	33	44	56.4
1935	74	29	23	16	45	60.8
1936	79	23	19	12	56	70.8
1937	95	19	14	14	76	80.0
1938	82	16	10	9	66	80.5
1939	91	32	22	11	59	64.8
1940	80	21	15	5	59	73.7
1941	84	26	19	14	58	69.0
1942	83	30	20	8	53	63.8
1943	89	32	14	0#	57	64.0
1944	96	27	11	9	69	71.9
1945	77	23	8	1	53	68.8
1946	83	33	17	18	50	60.2

The above tabulation refers to appearances of Passaic Valley sewage. Effects of sewage from other sources which are occasionally visible in the area are not included in this table.

** Passaic Valley Trunk Sewer went into operation on August 2, 1924. Not full flow.

It is interesting to note that in 89 inspections spread over the year 1943, no appearances of suspended fine sewage solids were observed. It may be of significance to note in connection with this fact that considerably more sludge than usual was removed from the sedimentation basins during 1943, and furthermore, the flow of sewage through the basins was greatly diminished during periods of bypassing of sewage to the Passaic River.

Physical Aspects At P. V. Sewage Dispersion Area.
Values Expressed As Percentages Of Total Inspections
Throughout the Stated Years.

Over Entire Year of	Total Number of Inspections	Color Found Per Cent	Sewage Odors Present Per Cent	Visible Suspended Particles Present Per Cent	All Clear Per Cent
1924*	26	3.8	0.0	3.8	96.1
1925	52	13.5	1.9	0.0	86.5
1926	71	18.3	8.5	0.0	81.6
1927	74	20.3	10.8	6.8	79.7
1928	75	17.3	2.7	4.0	82.6
1929	64	12.5	7.8	6.3	87.5
1930	78	29.5	16.7	9.0	69.2
1931	77	28.6	18.2	13.0	71.4
1932	82	39.0	26.8	19.5	61.0
1933	81	43.2	30.8	27.2	56.8
1934	78	43.6	42.3	42.3	56.4
1935	74	39.2	31.1	21.6	60.8
1936	79	29.1	24.0	15.2	70.8
1937	95	20.0	14.7	14.7	80.0
1938	82	19.5	12.2	11.0	80.5
1939	91	35.2	24.2	12.1	64.8
1940	80	26.2	18.7	6.3	73.7
1941	84	31.0	22.6	16.7	69.0
1942	83	36.1	24.1	9.6	63.8
1943	89	36.0	15.7	0.0#	64.0
1944	96	28.1	11.5	9.4	71.9
1945	77	30.0	10.4	1.3	68.8
1946	83	39.8	20.5	21.7	60.2

* Passaic Valley Trunk Sewer went into operation on August 2, 1924.

\# It is interesting to note that in 89 inspections spread over the year 1943, no appearances of visible suspended particles of sewage solids were observed. It may be of significance to note in connection with this fact that considerably more sludge than usual was removed from the sedimentation basins during 1943, and furthermore the flow of sewage through the basins was greatly diminished during periods of bypassing of sewage to the Passaic River during 1943.

TABLE 7

AGE PERCENTAGE WATER CONTENT OF PASSAIC VALLEY SEWAGE SLUDGE

COMPOSITE SAMPLES OF MATERIAL AS LOADED INTO BARGE

Month	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
January	89.3	90.5	90.4	91.0	91.0	90.9	90.4	90.6	90.4	90.5
February	89.8	89.9	89.6	91.7	91.4	90.4	91.2	90.3	90.6	90.9
March	90.1	89.7	89.6	90.8	90.6	91.0	90.1	90.2	90.4	91.1
April	89.8	89.7	89.8	91.0	90.9	90.6	89.7	90.2	90.3	90.9
May	89.9	90.1	90.2	90.6	91.9	90.4	90.2	90.2	90.4	90.4
June	89.8	89.9	89.6	90.1	90.4	90.1	90.2	90.2	90.3	90.1
July	88.4	90.0	92.3	89.6	91.6	90.0	90.3	89.7	90.3	90.9
August	90.9	90.4	91.8	89.5	90.8	90.3	90.2	90.1	90.2	90.4
September	90.3	90.4*	90.1	90.7	91.1	91.3	91.0	90.3	90.8	91.2
October	89.1	90.7	91.9	91.0	91.0	91.1	90.9	90.6	90.9	90.7
November	90.8	90.7	91.3	#	91.1	91.4	90.9	90.2	91.1	91.3
December	91.3	90.1	92.4	#	91.2	91.1	90.9	90.6	90.9	91.6

Month	1938	1939	1940	1941	1942	1943	1944	1945	1946
January	91.7	90.7	91.5	90.7	90.7	90.9	92.2	91.2	92.4
February	91.4	90.3	91.8	92.3	91.0	91.1	91.4	91.9	91.4
March	91.5	90.3	91.3	91.6	90.8	90.7	91.2	91.6	90.7
April	91.2	90.4	90.9	90.9	90.8	90.8	(-)	90.5	89.8
May	90.5	90.6	90.9	91.2	90.6	91.0	91.3	90.5	89.1
June	90.3	90.6	90.6	91.1	90.6	90.9	91.4	91.0	88.5
July	90.5	90.4	90.5	90.9	90.6	90.1	90.8	91.1	88.6
August	90.4	90.4	91.0	91.1	90.1	90.8	91.2	91.2	89.5
September	90.7	90.9	90.6	90.9	90.6	91.1	91.5	91.8	91.1
October	91.0	90.7	90.7	91.2	90.7	91.7	92.0	91.6	90.1
November	91.7	90.5	90.9	91.2	90.5	92.2	91.7	90.9	91.1
December	90.9	90.8	92.2	91.0	90.9	93.7	91.5	92.1	91.5

Yearly Average

1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
90.0	90.2	90.8	90.6	91.1	90.7	90.5	90.3	90.5	90.8

1938	1939	1940	1941	1942	1943	1944	1945	1946
91.0	90.5	91.1	91.2	90.6	91.3	91.5	91.3	90.3

* In September 1929, some changes at screens and grit chambers were affected.

\# No samples of sludge during these months because of alterations to PV dock.

(-) No sludge produced during April, 1944 as all raw sewage was by-passed to Newark Bay during the period of March 8, 1944, to May 8, 1944, because of replacement of valves at Newark Bay Pumping Station.

APPENDIX TWO

to report of February 20, 1947 is to indicate:-

"that the grave results (to the entire Upper Bay), which were at one time confidently expected and feared have not materialized".

.....

The fear of grave damage to the entire Upper New York Bay from the proposed discharge of P. V. sewage was one of the motivating forces which resulted in the original suit, and the introduction of the Stipulation partly allayed those fears and broke the impasse.

That these fears were real and were expressed in public print is indicated by the following:-

Metropolitan Sewerage Commission, N. Y., 1912 Report:-

"In 1911, several groups of samples were collected in Upper New York Bay in the vicinity of Robbins Reef. The object in taking these samples was to secure data which might serve as a basis for comparison with samples to be collected in future in case the Passaic Valley Sewer was put in operation".

The late Mr. Kenneth Allen, for many years Chief Sanitary Engineer to the City of New York, writing in the 1921 report of the Board of Estimate and Apportionment of New York City, said in part:-

"The situation, especially as to the Upper Bay, is further aggravated by the decision in the Passaic Valley Sewer case, handed down by the U. S. Supreme Court about the first of May, by which permission is granted to discharge eventually several hundred million gallons of settled sewage daily from municipalities in New Jersey at the edge of the Main ship channel in the Upper Bay near Robbins Reef. If this plan should be carried out without further modifications, the pollution of the Bay will be greatly intensified".

Mr. Allen in City Record, N. Y. Jan.28, 1925: "The discharge of sewage from the Passaic Valley Sewer commenced on August 2nd....It is discharged into the main channel off Robbins Reef, which is now an important focus of pollution that will be reflected by lowering the dissolved oxygen content of the entire Upper Bay;"

That these fears of grave damage to the entire Upper New York Bay were gradually allayed is indicated in the following:-

1926. Report of Kenneth Allen to Board of Estimate and Apportionment, N. Y.

"At Robbins Reef, near the Passaic Valley Sewer outlet, the effect of the discharge was not as evident as might be expected, for although the degree of saturation was very low - 12 per cent - it was lower still in a sample tested in 1921, before a discharge took place.

.... The direct effect of the Passaic Valley sewage on the dissolved Oxygen in the surrounding water is not as apparent as was at one time anticipated, although its demand on the available

supply of Oxygen is unquestioned. During the past year its presence has been made evident, especially at times of slack water, by its dark color, by small particles of sewage solids and froth, and, in at least two instances, by the odor of sulphureted hydrogen. These evidences were not, however, so obvious as to attract the notice of the casual passer-by."

1927. Allen. "It would appear, on a consideration of the entire evidence, that there has been a substantial absence of visible particles, odor and color, due to discharge of sewage near Robbins Reef, but that there has been a small but definite lowering of the dissolved Oxygen of the bay due to this cause with a sewage flow of about 100,000,000 gallons per day."

1928. Allen. "Taking this into consideration (meteorological conditions) it may be said that, broadly speaking, the condition of the harbor waters has not appreciably changed during the past year. There is no evidence of a material increase of pollution due to the Passaic Valley sewage, for although the average amount of dissolved Oxygen appears to have diminished at The Narrows, it is greater at those points in the Upper Bay where its influence would naturally be felt. The field of pollution can be seen on the surface near the outlet for short periods under favorable conditions of tide and wind".

1929. Allen. "The effect of the discharge of sewage from the Passaic Valley is more marked than heretofore along the neighboring shores of Staten Island but, as in the previous year, the only ocular evidence occurs temporarily under favorable conditions of wind at slack tide."

Mr. William T. Carpenter, who in 1930 had been in charge of the testing of New York Harbor for about twenty years, stated in a paper presented at a meeting of the New York State Sewage Works Association on January 18, 1930, that:- "Only certain portions of New York Harbor are low in Oxygen. The Hudson is at all times well above the danger line. The Upper and Lower Bays are, in general, good, despite the discharge of large volumes of sewage from the Passaic Valley outlet."

Further to indicate that the introduction of Passaic Valley sewage into New York Bay did not result in depletion of dissolved oxygen to such extent as forbidden in the Stipulation, a tabulation of dissolved oxygen values at two significant points in New York Harbor, from 1909 to 1946, is appended.

Summer Average Percentage Dissolved Oxygen Saturations.
(June 1 to October 1), in Stated Years.
At Two Significant Points in Upper New York Bay.

Source of Analyses	Year	Percentage Dissolved Oxygen Saturation Robbins Reef	The Narrows
Metropolitan Sewerage Commission, New York City.	1909	67	83
	1911	72	76
	1913	66	69
Board of Estimate and Apportionment, New York City.	1914	71	68
	1915	72	78
	1916	64	63
	1917	50	63
"	1920	44	52
"	1921	33	35
Passaic Valley Sewerage Commissioners, Newark, N. J.	1923#	49	52
	1924*	60	67
	1925	60	70
	1926	49	52
	1927	58	57
"	1928	52	56
"	1929	46	54
"	1930	44	54
"	1931	49	56
"	1932	46	53
"	1933	49	55
"	1934	45	51
"	1935	47	53
"	1936	45	53
"	1937	45	54
"	1938	47	51
"	1939	43	47
"	1940	44	53
"	1941	48	51
"	1942	44	(-)
"	1943	50	59
"	1944	53	64
"	1945	49	54
"	1946	50	59

During 1923, samples were from August 1 to October 1. Other samples are from June 1 to October 1, inclusive.

* Passaic Valley discharge into New York Bay commenced August 2, 1924.

(-) Sampling discontinued during 1942 because Narrows Sampling Station was an important concentrated naval and military area.